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BRITISH INTELLIGENCE SURVEY

SOMALI REPUBLIC

Part VIII(A): TERRAIN, CLIMATE AND MAP COVERAGE

DEFG 60/209

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BRITISH INTELLIGENCE SURVEY ON THE SOMALI REPUBLIC

Part VIII (A) : TERRAIN, CLIMATE AND MAP COVERAGE
(D/6/VIII (A) : JANUARY 1965)

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BRITISH INTELLIGENCE SURVEY ON THE SOMALI REPUBLIC

1. This report covers terrain, climate and mapping in the Somali Republic and is one of a series dealing with subjects of particular interest to Service Staffs. The reports are also distributed to various Government departments. A distribution list is given at the end of this report. The various Parts of the B.I.S. are issued separately for the convenience of users, and to speed up preparation and revision.

2. Other Parts of the B.I.S. which have been or will be issued in this series are as follows :

III (B)	Oil Storage and Distribution
V	Transportation
VI	Airfields (see paragraph 3 below)
VII	Beaches and Landing Places
VIII (B)	Towns
VIII (C)	Military Engineering Resources
X (A)	Health
X (B)	Telecommunications

3. Information on Airfields and Flying Boat Bases is to be found in the Airfield Handbook J5/72 and Regional Study J5/103/2. Ports are described in the D.I.S. series of Port Information Sheets. A general survey of the Somali Republic is included in the D.I.S. series of Intelligence Briefing Memoranda.

4. Except where otherwise stated, the information in this report is that available in D.I.S. as at January 1965. A brief referring to the main gaps in our information will be prepared after the issue of this B.I.S.

5. Place name spellings are as far as possible those found in Series 1404 (World, 1 : 500,000) for areas north of 8°N and in Series 1301 (World, 1 : 1,000,000) for areas south of 8°N.

6. D.I.S. would welcome the views of users of this report on :—

a. any statement considered incorrect ;

b. any notable omissions ;

c. any means of improving the method of presentation.

7. The chapter on climate has been contributed by the Meteorological Office and the chapters on map coverage by the Directorate of Military Survey.

8. New information received will be promulgated as soon as possible by the issue of one of the following, depending on circumstances :

a. A *new edition* of this report.

b. *Check Bulletin*. These will show the main changes affecting the information contained in this report and in any amendments to it issued under c below. The Check Bulletin should be *retained with this report and consulted whenever the latter is used.* (As Check Bulletins are cumulative, only the latest need be retained).

c. *Amendments* in the form of new pages, for incorporation in this report. It is important that such amendments should be correctly incorporated (and recorded on the sheet provided at the front of this report). In preparing Check Bulletins it is assumed that this has been done.

9. Requests for further information, including more detail than that in the text, should be made to :—

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3. Somali Republic: Terrain Regions

CHAPTER I

INTRODUCTION

1. The Somali Republic, which was proclaimed an independent State on 1st July 1960, comprises the former British Somaliland Protectorate and the former Italian-administered U.N. Trust Territory of Somalia. With an area of some 258,000 square miles (rather more than $2\frac{1}{2}$ times that of the United Kingdom) it occupies a large part of the Horn of Africa, bordered on the north by the Gulf of Aden and on the east by the Indian Ocean. Inland, the Republic has a long frontier with Ethiopia and Kenya, and in the extreme north-west it borders French Somaliland.

2. With the exception of the boundary with Ethiopia south of latitude 8° N. the frontiers of the Republic are both defined and demarcated. The boundary between Ethiopia and the former Italian Somaliland has never been satisfactorily delimited. A Convention of 1908, between Italy and Ethiopia, defines the frontier clearly only between Dolo and the Uebi Scebeli, and this line is in part demarcated. North of the Uebi Scebeli the frontier was defined as the " line accepted by the Italian Government in 1897 " ; the text of this acceptance is not available and the present administrative boundary remains in dispute.

3. The frontier dispute in part stems from the clash between political boundaries on the one hand and tribal boundaries on the other, a feature also of the frontiers with Kenya and French Somaliland and of the northern Ethiopian frontier. Somali tribes occupy a large part of the Horn of Africa outside the borders of the Republic, including the North Eastern Region of Kenya, the greater part of eastern Ethiopia and part of French Somaliland. Since the political frontiers cut across areas traditionally used by nomadic Somali herdsmen for grazing and watering, border disturbances are a common occurrence ; the problem has been exacerbated in recent years by the demands of the Republic for a " Greater Somalia ", embracing all the Somali peoples of the Horn of Africa.

4. In the report which follows, the terrain and map coverage of the former British Somaliland Protectorate (Northern Region) and of the former U.N. Trust Territory of Somalia (Southern Region) are dealt with separately. The chapter on climate deals with the Republic as a whole.

CHAPTER II

TERRAIN, NORTHERN REGION

Relief and Drainage

5. The greater part of the northern region consists of a level to gently undulating plateau between 2,000 and 4,000 feet above sea level, extending across the frontier with Ethiopia. The plateau rises gradually northwards to end abruptly in a steep, irregular escarpment, falling some 4,000 feet through a broad belt of rugged, mountainous country to a narrow coastal plain flanking the Gulf of Aden.

6. The coastline is backed by dunes and salt flats, interrupted in places by mangrove-fringed lagoons or by steep, rocky headlands. Inland there are level to gently undulating sand and gravel plains, crossed by numerous wadis (*tugs*). Narrow and discontinuous in the east, the coastal plain widens westwards to some 40 miles south of Zeila, and inland rises gradually into the broken foothills of the plateau escarpment. In the east, beyond the Asse gap, the escarpment is almost unbroken and rises in a series of great cliffs to a maximum height of 7,898 feet at Shimber Berris. To the west the escarpment is lower and more broken, and deep, narrow, winding valleys give access to the interior plateau through a number of passes. Behind the escarpment, which in places rises well above the adjoining plateau, level to gently undulating sandy plains fall away southwards to the Ethiopian frontier. Locally the plains are interrupted by scattered steep-sided and flat-topped hills and low ranges, particularly along the northern margins of the plateau, and around the Sol Haud basin and Nogal valley.

7. Drainage is intermittent throughout the region, the *tugs* carrying water only for short periods during and after rainfall except in the upper parts of the escarpment zone where a number of *tugs* have short perennial reaches. Rain may occur in any month, usually in the form of showers or thunderstorms, but the wettest months are normally from March or April to October or November ; in the coastal lowlands, however, much of the very slight average annual rainfall occurs during the period November to April. Runoff is rapid and the *tugs* rise quickly, often to considerable heights ; in some of the larger *tugs* depths of 20 feet have been recorded in spates. On the interior plateau there are few continuous well-defined *tugs*, except

along the northern margins, but rainfall tends to accumulate in shallow depressions (*ballehs*) which may hold water for some time. Two major N.W.-S.E. depressions occur in the southern part of the plateau : the Bokh, running from Odweina to the Ethiopian border at Bohotleh, and the Nogal, an easterly continuation of the Tug Der.

Vegetation and Soils

8. The distribution of the main vegetation types is indicated in map 2 (in end pocket). On the interior plateau the vegetation is predominantly open acacia woodland and grass, with scrub and grass in the Nogal and Daror valleys and in the Heman basin ; locally the vegetation cover consists of acacia trees and scrub, notably around Hargeisa, north of Odweina and Burao, and along the flanks of the Nogal valley. On the coastal plain the vegetation is predominantly scrub and grass, with some coastal salt marsh and mangrove trees locally around lagoons. The escarpment foothills support a cover consisting largely of acacia tree and scrub, though considerable areas are devoid of vegetation ; at higher levels on the escarpment greater rainfall gives rise to a more luxuriant vegetation and there are some areas of woodland and juniper forest.

9. In plateau areas soils are predominantly sandy clays, becoming more sandy in the west and south-west ; in a number of places, especially in the east and south-east, secondary limestone or gypsum forms a hard crust on the surface or at shallow depth (*kankar*). On the coastal plain soils are predominantly sands and gravels, with some areas of sandy clay soils in the north-west and east. In the escarpment zone soils are varied, but generally thin and stony, and there are extensive areas of bare rock ; *tug* beds are general of sand and gravel, becoming increasingly boulder-strewn inland.

Settlement and Land Use

10. About 85 per cent of the population of the northern region is nomadic to some degree. Only about 10 per cent are permanent town dwellers, although a number of the nomadic stockherders live temporarily in towns. The other 5 per cent are settled agriculturalists, found mostly in the higher rainfall areas of the western plateau. Small farmers, using fairly primitive methods, grow sorghum, maize and vegetables. Attempts are being made to develop irrigated agriculture by conserving water from *tug* spates, notably in the Tug Der, south-east of Burao, at Holholka on the Ethiopian border near Borama, and west of Odweina at Dobowein.

11. In the coastal lowlands there are few permanent settlements apart from ports and small fishing villages ; the majority of the people are nomadic herdsmen, though in the escapement foothills there are a number of small settled agricultural communities. Settlements are mostly small collections of semi-permanent, flat-roofed, wattle and daub huts. On the interior plateau the population is almost entirely nomadic, moving with the herds of cattle, sheep and goats, and living in small, temporary huts of mats and skins spread over a semi-circular wooden frame. The only permanent buildings, outside the towns, are isolated stone or mud huts at water-holes or in cultivated areas along the northern margins of the Haud.

Effect of Terrain on Military Operations

12. Paragraphs 13 to 28 below describe the effects of terrain on military operations with specific reference to cross-country movement for wheeled vehicles, sites suitable for light aircraft landing strips, dropping zones and helicopter pads. For this purpose the northern region is divided into the following topographical units (see map 3 in end pocket) :

I. The Coastal Lowlands
   a. Loyada-Berbera
   b. Berbera-Raguda
   c. Raguda-Elayu
II. The Escarpment Zone
III. The Interior Plateau
   a. The Haud
   b. The Sol Haud
   c. The Nogal and Daror Valleys

I. The Coastal Lowlands

I. (a) *Loyada-Berbera*

13. In this sector the coastal lowlands consist largely of level to gently undulating sandy plains with low scrub and tussock grass, passing inland into gravel plains with sparse scrub near the foot of the escarpment. Some 40 miles in width south of Zeila, the plains narrow

considerably eastwards and in the Bulhar-Berbera area are interrupted by steep-sided hills and ridges forming the escarpment foothills. Going is generally fair, but on the sandy plains is locally poor in areas of denser scrub or of sand hummocks. The plains are crossed by numerous *tugs*, to which access is generally good and which in dry weather provide fair going ; after rain (mainly October-March) the *tugs* impede cross-country movement for some hours. Along the coast are areas of low sand dunes and salt flats. North of Saba Wanak the dunes form a continuous belt up to two miles wide and passable only with difficulty. The dunes are backed by an extensive area of salt flats ; baked hard during the dry season the flats provide good going, but the area is generally impassable during the wet season.

14. Sites suitable for light aircraft landing strips occur on the inner gravel plains and, during the dry season, on the coastal salt flats north of Saba Wanak ; on the outer sandy plains considerable levelling and vegetation clearance would be necessary. Sites suitable for use as dropping zones are of more general occurrence and the area as a whole is suitable for helicopter landings, except on the coastal salt flats during the period October-March.

I. (b) *Berbera-Raguda*

15. Sand and gravel plains with a vegetation of low open scrub around Berbera pass eastwards into an extensive area of rolling sand dunes. Between Ras Sudda and Ras Khanzira the lowlands comprise level to gently undulating sandy plains with tussock grass, or low dunes. At Ras Khanzira the escarpment foothills reach the coast in a rocky headland, though a number of gaps in the hills occur a short distance inland. East of Ras Khanzira the coastal plain is narrow and areas of low sand dunes and tussock grass alternate with areas of sand, gravel and scrub ; locally salt flats and mangrove-fringed lagoons back the coastline. Around Raguda gravel plains support a cover of scattered low scrub. Opportunities for cross-country movement by wheeled vehicles vary considerably : around Berbera and Raguda the going is fair to good, but elsewhere conditions are generally fair to poor and in the area of dunes between Berbera and Ras Sudda off-road movement is impracticable. After rainfall movement generally is obstructed for a time by the numerous tugs which cross the lowlands, and during the wet season the coastal salt flats are impassable.

16. Sites suitable for light aircraft landing strips occur around Berbera and Raguda and locally in the plains east of Ras Khanzira, sites suitable for use as dropping zones also occur within these areas. With the exception of the sand dune area east of Berbera, the rocky Ras Khanzira area and, during the wet season, the coastal salt flats, there are few obstacles to helicopter operations.

I. (c) *Raguda-Elayu*

17. In this sector the coastal lowlands are narrow and discontinuous, with a maximum width of some 5 or 6 miles except in the east where they reach some 12 miles in width south of Durdureh. In general the lowlands comprise level to gently undulating gravel plains with a sparse cover of bush and scrub ; locally there are areas of very rough stony surfaces or of sand and tussock grass, and sand dunes occur between Gaan and Durdureh. Opportunities for cross-country movements are generally fair, but conditions are locally bad on stony surfaces. For a short time during and after rainfall *tugs* interrupt movement.

18. Sites suitable for light aircraft landing strips and dropping zones occur widely ; the only generally unsuitable areas are those of sand dunes or of rough stony surfaces. Conditions are generally good for helicopter landings.

II. The Escarpment Zone

19. The irregular and broken escarpment which separates the coastal lowlands from the interior plateau ranges in height from 4,000 to over 7,500 feet and forms a considerable barrier to movement. In the east, beyond Erigavo, the escarpment forms an almost continuous wall of great cliffs, individually up to 500 feet high. Elsewhere there is a broad belt of rugged, deeply-dissected terrain with narrow winding valleys. The lower part of the escarpment and the foothills consist of sharp ridges with steep, precipitous valleys and parallel hill ranges or isolated steep-sided hills separated by wide sand, gravel or stony plains.

20. The escarpment is crossed by a number of motorable roads and tracks, particularly in the area between Erigavo and Hargeisa where the scarp is lower and more broken (for further details see B.I.S. Part V, Transportation). Off-road movement is generally impracticable except in the foothills where sandy, gravel or stony plains give fair going over limited areas between Hagal, Las Dureh and El Dur Elan, and south and south-east of Berbera. Off-road movement from the coastal lowlands into the escarpment zone is possible only for varying distances along the major *tug* beds during dry weather ; reconnaissance may reveal through routes to the plateau but going is likely to be very difficult.

21. The region is generally unsuitable for airborne operations, except by helicopters. Sites suitable for light aircraft landing strips and dropping zones occur only in the lower foothills in the major tug beds or on the scattered plains. These areas and *tug* beds at higher altitudes provide sites suitable for helicopter landings.

III. The Interior Plateau

III. (a) *The Haud*

22. Flat-topped hills with deep, steep-sided valleys along the crest of the escarpment give way southwards to flat, almost featureless sandy plains. The surface slopes gently to the broad N.W.-S.E. Tug Der and Bokh depression. The plains are interrupted locally by steep-sided hills and low hill ranges, particularly near the escarpment and along the flanks of the Nogal (Tug Der) valley in the south-east ; termite hills occur frequently and reach heights of up to 20 feet. *Tugs* are generally ill-defined and discontinuous, except along the northern margins and around the Nogal valley. The vegetation is predominantly open acacia woodland and grass, with extensive grassy plains in places ; thick scrub occurs locally and may be dense in places. In some areas grazing and erosion has produced barren dune country around the wells, near Burao for example.

23. There are few obstacles to cross-country movement or airborne operations. Under dry weather conditions going is generally fair to good ; locally conditions are poor, along the margins of the Nogal valley and in areas of denser scrub. During and for a short time after rainfall (mainly April-October) movement generally is impeded by *tugs* and water-filled hollows (ballehs), often up to several acres in extent. Sites suitable for light aircraft landing strips and dropping zones occur over most of the Haud ; some clearance of vegetation may be necessary. Helicopter landings may be made almost everywhere.

III. (b) *The Sol Haud*

24. An outer belt of almost featureless sandy clay plains similar to the Haud slopes gently to the salt-encrusted Heman basin. Except in the north-west, the area is bordered by an outward-facing, broken escarpment up to 150 feet in height. There are few *tugs*, except along the margins of the area, and water collects in *ballehs* after rain. Vegetation is largely scrub and grass, with a few acacia trees.

25. Cross-country movement for wheeled vehicles is generally fair to good except along the broken outer margins of the area, though there are many gaps in the surrounding escarpment. After rain (mainly April to October) *tugs* and *ballehs* obstruct movement locally for a short time, and in the Heman basin going is likely to be poor to bad for a time on surfaces which consist largely of secondary gypsum.

26. Sites are readily available for light aircraft landing strips and dropping zones except along the outer margins of the Sol Haud and after rainfall in the Heman basin. The area as a whole is suitable for helicopter operations, with local restrictions after rain.

III. (c) *The Nogal and Daror Valleys*

27. The Daror valley in the north and the Nogal valley in the south comprise broad, open basins surrounded by broken, hill country. The basins are floored by level to gently undulating plains of more or less gypseous, sandy clay, becoming gravelly or stony along their margins where there are numerous incised *tug* beds ; elsewhere *tugs* are shallow and ill-defined. The *tugs* carry water for short periods only during and after rainfall, when water also accumulates in scattered *ballehs*. The vegetation is predominantly sparse scrub and grass.

28. Cross-country movement for wheeled vehicles is generally fair to good during dry weather, except in and near the hills surrounding both valleys. For short periods during and after rainfall (mainly April-October) going is generally poor, and locally movement is obstructed by *tugs* and *ballehs*. Except for a short time after rainfall sites suitable for light aircraft landing strips and dropping zones are readily available in both valleys ; sites suitable for helicopter pads occur generally.

CHAPTER III

TERRAIN : SOUTHERN REGION

Relief and Drainage

29. The greater part of the southern region consists of a level to gently undulating plateau, falling gradually south-eastwards from heights of some 1,500 to 2,500 feet along the Ethiopian frontier to dune-covered lowlands bordering the Indian Ocean. Isolated steep-sided hills and

low ranges rise above the surface of the plateau, which is interrupted in the south by the deeply incised valleys of the Uebi Scebeli and Giuba (Juba) river and in the north by the deep trenches of the Nogal and Daror valleys. North of the Daror valley the plateau rises sharply to a rugged, deeply-dissected mountain region, forming a continuation of the plateau escarpment in the northern region, which extends E.N.E. to the coast at Cape Guardafui and in places reaches heights of over 7,000 feet. Narrow discontinuous lowland areas of sand and gravel plains or dunes flank the Gulf of Aden and northern Indian Ocean coastlines.

30. In general, the pattern of drainage conforms to the south-eastward slope of the plateau; the north-facing slopes of the northern mountains are drained to the Gulf of Aden. Over much of the plateau, however, away from the main valleys, drainage is ill-defined and largely internal. The majority of streams (*bohols* or *tugs*) dry up or end in swamps (*descecs*) before reaching the coast or the main rivers or wadis ; over much of the plateau runoff tends to accumulate in shallow depressions (*ballehs*).

31. With the exception of the Scebeli and Giuba rivers drainage is intermittent and streams flow only for short periods during and after rainfall, which usually occurs in the form of showers. In the southern part of the province most of the rainfall occurs between April and November ; the wettest months are normally April to May or June and September or October to November. Rain-fall amounts decrease markedly northwards and in the extreme north most of the very slight annual fall occurs in the period November to April. The Scebeli and Giuba rivers, which rise in the Ethiopian highlands, are perennial, though with marked seasonal variations in flow. Neither receives any substantial discharge from tributaries in the Somali Republic and the régime of both rivers is determined largely by the rains in Ethiopia. The high-water period is normally from March to December, with peaks during the months April to June and September to November when extensive flooding occurs.

Vegetation and Soils

32. The distribution of the main vegetation types is indicated in map 2 (in end pocket) Most of the region supports a cover of bush, low scrub and grass which varies in character and density according to local soil and climatic conditions. South of the Uebi Scebeli the vegetation consists largely of open acacia woodland, becoming increasingly broken towards the north and passing into low scrub and grass along the Ethiopian frontier and along the Kenya border north of El Wak. Extensive savannas occur in the areas between Bur Acaba and the Scebeli and south of Lach Dera. South of the Giuba coastal areas support dense evergreen forest and thicket ; in places the coastline is fringed by mangroves. In the Scebeli and Giuba valleys land not cultivated supports a dense growth of bush, within which there are some large clear areas and, locally, patches of marsh ; the marshes are particularly extensive in the lower Scebeli and Giuba valleys. North of the Scebeli much of the Mudugh plateau and coastal lowlands supports a cover of broken, open acacia woodland, low scrub and grass ; north of Rocca Littorio (Gallacaio) the vegetation is predominantly low scrub and grass, becoming increasingly sparse towards the north where in the northern mountain region large areas are devoid of vegetation. At high altitude in the mountains, however, there is some acacia woodland and patches of evergreen forest.

33. Over the greater part of the region fine-grained soils are predominant. South of the Scebeli soils are generally deep and range from sandy loams to silty clay loams ; clays occur over a wide area along the northern Kenya and Ethiopia frontier. The courses of the Scebeli and Giuba rivers are marked by broad strips of deep alluvial soils. North of the Scebeli soils are predominantly more or less sandy clays, locally gypseous and in the north often thin and stony ; in some places secondary limestone or gypsum forms hard surface crusts (*kankar*). Sands and gravels are typical in the coastal lowlands.

Settlement and Land Use

34. Much of the region is very sparsely populated ; some threequarters of the population is found in the area south of the Uebi Scebeli. Of the total population approximately 43 per cent are nomadic pastoralists who follow grass and water with their herds of cattle, sheep, camels and goats in a reasonably regular annual migration. Some 30 per cent of the population are semi-nomadic, combining dry farming with animal husbandry. The main dry farming areas are in the valleys of the Giuba and Scebeli and on the intervening plateau ; durra (millet), maize and beans form the main crops and are dependent on seasonal rainfall or on annual flooding by the rivers. Some 17 per cent. of the population are settled agriculturalists, engaged chiefly in irrigated cultivation of commercial crops (mainly bananas, citrus and cotton) along the banks of the lower Giuba and lower Scebeli rivers. The remaining 10 per cent of the population is largely urban though along the coast small numbers are engaged in fishing.

35. Rural settlements consist largely of small collections of thatched, square (or occasionally circular), wattle and daub huts. The nomadic herdsmen occupy portable huts consisting of a wooden frame over which mats and skins are spread.

Effect of Terrain on Military Operations

36. Paragraphs 37 to 55 below describe the effects of terrain on military operations with specific reference to cross-country movement for wheeled vehicles, sites suitable for light aircraft landing strips, dropping zones and helicopter pads. For this purpose the southern region is divided into the following topographical units (see map 3 in end pocket) :

I. The Northern Mountains and Coastal Lowlands.
II. The Shol Plateau and Daror and Nogal Valleys.
III. The Mudugh Plateau and Coastal Lowlands.
IV. The Scebeli Valley.
V. The Scebeli-Giuba Plateau.
VI. The Giuba Valley.
VII. The Trans-Giuba Plateau and Coastal Lowlands.

I. The Northern Mountains and Coastal Lowlands

37. The escarpment and foothills which mark the plateau edge in the northern province extend E.N.E. to the coast at Cape Guardafui. The escarpment is deeply dissected by generally N.W. and S.E. trending wadis to form a rugged mountain region rising to a maximum height of over 7,000 feet, falling steeply to the Gulf of Aden in the north and more gradually southwards through broken plateau country to the deep trench of the Daror valley. At the foot of the mountains narrow, discontinuous lowlands border the Gulf of Aden and Indian Ocean. The lowlands generally comprise level to gently undulating plains of sand and gravel crossed by numerous wadis, and support a sparse vegetation of low scrub and tussock grass. The coastline is generally backed by a narrow belt of sand dunes with patches of salt marsh ; between Tohen and Olloch dunes occupy the greater part of the coastal plain.

38. In the coastal lowland areas the opportunities for cross-country movement by wheeled vehicles are generally fair ; the dunal areas are passable only with difficulty. For short periods during and after rainfall (mainly November-December) movement is obstructed by numerous wadis. In the mountains movement is largely confined to motorable roads and tracks (for further details see B.I.S. Part V, Transportation) ; during dry weather some penetration of the mountain area is possible along the major *tugs*.

39. In the coastal lowlands areas of sand dunes and salt marsh form the only serious obstacles to airborne operations. Sites suitable for helicopter pads are widespread and a number of sites suitable for light aircraft landing strips and dropping zones occur. The mountain region is generally suitable only for helicopter operations.

II. The Shol Plateau and Daror and Nogal Valleys

40. To the south the northern mountains fall away through escarpments or broken plateau country to the deep trench of the Daror valley. Some 50 miles wide in the west, the Daror valley narrows rapidly eastwards to some 10 miles near the coast. The valley is floored by gypseous, sandy clay plains which in the east fall in a series of low scarps to a 15 mile wide coastal belt of mobile sand dunes ; the Uadi Giahel (Dhut) occupies a deep trench in the centre of the plains. Vegetation is sparse, consisting mainly of low scrub with grass after rain.

41. On the southern margin of the Daror valley the Carcar hills mark the broken edge of the Shol plateau. The plateau consists of rolling plains with a gentle slope towards the south-east ; wide shallow basins of internal drainage are surrounded by low rounded hills. Locally the sandy clay surface is interrupted by patches of gravel or occasionally dune sands. Vegetation consists of sparse low scrub and grassland. Along the northern, eastern and southern margins the plateau is deeply dissected by wadis ; to the east the plateau falls in a series of low, broken escarpments to a narrow sandy coastal plain, and to the south falls steeply to the Nogal valley.

42. The Nogal valley is similar in outline to the Daror, narrowing from 46 miles in the west to 10 miles at Eil, and floored by level to gently undulating plains of more or less sandy clays, often gypseous, with a sparse vegetation of low scrub. On both sides the valley is bounded by broken escarpments.

43. Throughout the region opportunities for cross-country movement by wheeled vehicles are generally fair under dry weather conditions. Along the margins of the Nogal and Daror valleys and on the eastern edge of the Shol plateau conditions are difficult and movement is confined to motorable gaps. In the coastal lowlands conditions are generally poor. During and for a short time after rainfall (mainly March-May and September-November) conditions deteriorate on the gypseous plains of the Daror and Nogal valleys and in the internal drainage basins of the Shol plateau ; *tugs* and *ballehs* obstruct movement locally.

44. Sites suitable for light aircraft landing strips and dropping zones occur frequently throughout the area except along the valley and plateau margins and in the coastal dunes ; after rainfall soft or flooded surfaces form local obstacles. The area is generally suitable for helicopter operations.

III. The Mudugh Plateau and Coastal Lowlands

45. The plateau consists largely of level to gently undulating plains which fall gradually south-eastwards to rolling dune-covered lowlands bordering the Indian Ocean. Except along the edge of the Nogal valley and along the margin of the Scebeli valley in the south the plateau is virtually unbroken ; drainage is poorly developed and there are many *ballehs*. Vegetation consists largely of low scrub and grass with some broken acacia woodland in the area adjacent to the Ethiopian frontier. The coastal dunes range from a few miles in width in the north to some 75 miles in the south bordering the valley of the Scebeli. A narrow outer belt of bare mobile dunes passes inland into a wider area of old, consolidated dunes with a fairly dense cover of acacia and scrub with grass after rain.

46. Cross-country movement is generally poor or bad at all times in the coastal dune areas. Elsewhere, under dry weather conditions, going is generally fair except along the margins of the Nogal and Scebeli valleys where movement is largely confined to motorable routes. During the wet season (April to October or November) conditions deteriorate for short periods during and after rainfall when movement is hindered by numerous broad shallow drainage channels and *ballehs*.

47. Sites suitable for light aircraft landing strips and dropping zones occur frequently throughout the region except along the northern and southern plateau margins and in the dune-covered coastal lowlands. Helicopter operations are possible throughout the region, though in the fixed dune areas of the coastal lowlands scrub is generally dense and sites suitable for landing pads are few.

IV. The Scebeli Valley

48. Above Bulo Burti the Scebeli valley is relatively narrow and confined between the broken margins of the Mudugh and Scebeli-Giuba plateaus. Downstream the valley becomes shallow and open and its margins ill-defined ; to the east it merges with coastal dunes. Wide alluvial plains, with numerous marshy, abandoned channels flank the sluggish, meandering river course ; some 5 miles in width at the Ethiopian border, the plains broaden downstream to some 50 miles in width east of Gelib. For much of its course the Scebeli is bordered by a low, broad, natural levee and below Mahaddei Uen flows above the level of the surrounding plains during the high-water period (April to December). During the two periods of peak flow (May-June and September-November, of which the latter is the greater) extensive flooding occurs. The river gradually decreases in volume downstream through losses from evaporation, flooding or the demands of irrigation and ends in a large swampy area of interconnecting channels and ponds between Brava and Gelib. Where not cultivated the Scebeli plains support a fairly dense area of bush, within which there are a number of clear areas. The cultivated area is, however, considerable : between Balad and Gelib there is a large area of irrigated land on both banks of the river ; elsewhere there are many small dry farms.

49. During dry weather, opportunities for cross-country movement by wheeled vehicles are generally poor and locally impracticable in areas of denser bush growth, marsh, and irrigated farm land, or in areas of steep slopes flanking the river valley above Bulo Burti. Dry farming areas and occasional clearings within the bush provide better going. Information available suggests that the Uebi Scebeli is at no time fordable by wheeled vehicles. During and for some time after rainfall (April to October or November) conditions deteriorate throughout the valley and during the two flood seasons movement is generally impracticable in the vicinity of the river. Scattered sites suitable for light aircraft landing strips and dropping zones occur in the Scebeli plains. Helicopter operations would be less restricted.

V. The Scebeli-Giuba Plateau

50. The greater part of the plateau consists of level to gently undulating plains which fall gradually south-eastwards to the lower Scebeli valley. In the west broken hilly country flanks the upper valleys of the Scebeli and Giuba, while in a narrow belt between Bulo Burti and

Bardera the plains are interrupted by large granite domes (*burs*) which in places rise several hundred feet above the surrounding area. Drainage is intermittent and streams flow only for short periods during and after rainfall (March to November). Stream channels are generally broad and shallow, and locally ill-defined, except along the broken margins of the upper Giuba and Scebeli valleys ; much of the drainage is internal and there are many ponds (*ballehs*) after rain. The vegetation is largely open acacia woodland, often dense in the south-east near the lower Scebeli plains, but becoming more broken towards the north and interspersed with areas of grassland ; along the Ethiopian frontier the vegetation is chiefly scrub and grass. Soils are predominantly silty to sandy clay loams in the south and in the north loamy sands with some clay loams and clays. Dry farming is widespread throughout the region.

51. During dry weather opportunities for cross-country movement by wheeled vehicles are fair to good over the greater part of the region. During and for some time after rainfall (March to November) ground conditions are generally moist to wet and going deteriorates, and movement is interrupted locally by *tugs* and *ballehs*. Along the broken margins of the upper Scebeli and Giuba valleys, and in the areas of denser bush in the south-east, conditions are poor to bad at all times. Opportunities for airborne operations are generally good except in the areas of steep slopes along the upper Scebeli and Giuba valleys and of denser vegetation in the south-east. Numerous sites for suitable light aircraft landing strips and dropping zones occur, and except in the south-east there are few restrictions to helicopter landings.

VI. The Giuba Valley

52. The Giuba Valley is floored by broad alluvial plains, almost featureless except for the numerous marshy abandoned river channels. Some 4 to 5 miles wide at Dolo on the Ethiopian border, the Giuba lowlands broaden downstream to some 40 to 50 miles in width at the coast. Above Bardera the valley is flanked by the steep broken margins of the Scebeli-Giuba and Trans-Giuba plateaus ; downstream the valley is shallow and open, and the lowlands merge almost imperceptibly with the surrounding plains. For most of its course the Giuba is sluggish and meandering and bordered by a low, broad natural levee. In its lower course the river flows above the level of the surrounding plains, and at the two periods of peak flow (April-May and September-November) extensive flooding is liable to occur. Where not cultivated the Giuba lowlands support a dense bush cover, with grass during the rains ; in places along the river fringing forest is found. Between Gelib and Dolo there are scattered dry farms on both banks ; below Gelib there are extensive irrigated farms.

53. Opportunities for cross-country movement by wheeled vehicles are generally poor under dry weather conditions, and locally impracticable in areas of steep slopes along the margins of the upper valley, or in areas of marsh or irrigated agriculture. Detailed information on river characteristics is not available, but during the low water period (December-March) the Giuba may be fordable at a number of points above Bardera. During the wet season (April to November) conditions deteriorate throughout the valley for short periods during and after rainfall, and during the two flood seasons movement is likely to become impracticable in the vicinity of the river. Only scattered sites suitable for light aircraft landing strips and dropping zones occur in the Giuba valley. Sites suitable for helicopter pads occur widely.

VII. The Trans-Giuba Plateau and Coastal Lowlands

54. The region consists of level to gently undulating plains falling gradually southwards and eastwards to the Giuba valley and the Indian Ocean. North of Bardera broken hill country borders the Giuba valley and isolated hills and low ranges occur along the Kenya frontier between El Wak and Mandera and among dunes along the coast south of Chisimaio (Kismayu). Drainage is intermittent and the numerous streams flow only for short periods during and after rainfall (April to November or December). Stream channels are broad and shallow, and are flanked by or end in areas of seasonal marsh. Vegetation is predominantly more or less open acacia woodland, with some areas of savanna, becoming more broken towards the north and passing into scrub and grass in the area adjacent to the northern Kenya frontier. South of Lach Dera the bush is particularly dense, with some evergreen forest and thicket along the coast. Mangrove swamps occur on creeks and inlets on the coast behind the Bajun Islands. Soils are predominantly silty to sandy clay loams with loamy sands and clays in the north. Settlement is sparse and there is little farming in the region.

55. During dry weather opportunities for cross-country movement by wheeled vehicles are poor over the greater part of the region owing to the density of the bush. In the north conditions are generally fair in areas of scrub and grass on the northern Kenya border, though movement is locally obstructed by isolated hills and low ranges. In the south, conditions are

frequently bad south of Lach Dera, particularly in the area adjacent to the coast where the bush is impenetrable in places. During the wet season (April to November or December) conditions deteriorate considerably during and for some time after rainfall throughout the region and off-road movement is frequently impracticable. Sites suitable for light aircraft landing strips occur generally only in the northern area of scrub and grass ; suitable sites may also occur locally in more open grassy areas within the bush. Sites suitable for helicopter pads occur widely throughout the region, though generally scattered ; coastal areas are however generally unsuitable.

CHAPTER IV

CLIMATE

General

56. This chapter has been prepared by the Meteorological Office, in conjunction with the Naval Weather Service, and summarises the climatic factors affecting military operations. Further information is available in Investigations Division Climatological Report (I.D.C.R.) No. 61 issued by the Meteorological Office. A brief summary of the main climatic features is given in paragraph 93.

57. A list of places mentioned in this chapter is given in the table below :

Station	Latitude °N.	Longitude °E.	Height ft.
Bender Cassim	11° 17′	49° 10′	20
Berbera	10° 26′	45° 01′	32
Sheikh	09° 55′	45° 15′	4,800
Hargeisa	09° 29′	44° 05′	4,377
Bardera	02° 20′	42° 17′	387
Mogadiscio	02° 02′	45° 21′	33
Brava	01° 10′	44° 10′	40

Seasonal Weather and Weather Changes

58. The climate of the area is generally of an arid type with rainfall amounts small in most low lying areas and very small indeed in the northern coastal area. In the mountain areas the precipitation amounts are somewhat higher in places exposed to the Southwest Monsoon.

59. The climate is monsoonal in character and the year may be divided into two main seasons, according to the prevailing monsoon, and two short transitional seasons, as follows :

(*a*) Northeast Monsoon or winter period from about December to March.

(*b*) Spring transitional period of April and May.

(*c*) Southwest Monsoon or summer period from about June to September.

(*d*) Autumn transitional period of October and November.

The onset and length of each period varies somewhat with locality and from year to year. At times the transitional periods may be very short.

60. *The Northeast Monsoon* period is the dry season, generally, and little rain falls in most areas ; however, most of the very scanty rainfall of the area along the Gulf of Aden coast occurs at this time. Lowest average cloud amounts and some of the highest temperatures are recorded in this and the spring season, in the southern areas.

61. *The Southwest Monsoon* period is the rainy season in the south, where it is normally also the season of greatest cloud amount and lowest temperatures. On the northern coast it is a dry season and a time of very high temperatures.

62. *Spring and Autumn* are transition seasons between the two main seasons. In the spring, in the south, temperatures reach their maximum in many places and rainfall amounts are also at their greatest. In the autumn there is a secondary maximum of rainfall in the south. Tropical cyclones infrequently penetrate the Gulf of Aden.

TEMPERATURE

63. Compared with seasons in middle latitudes, conditions are hot, or very hot, throughout the year. Two distinct temperature régimes occur according to the effect of the prevailing monsoon. In southern areas, which are exposed to the Southwest Monsoon, the lowest temperatures usually occur in summer and the highest in spring. In the north, which is sheltered from the Southwest Monsoon, temperatures are more extreme.

64. Mean temperatures, in the south are about 29° C. during April and 26° C. in August, on the coast and 31° C. in April and 27° C. in August, inland. In the north, at low levels, they vary from 25° C. in January to about 36° C. in July. Exceptionally, temperatures as high as 45° C. or as low as 15° C. have been recorded in the north and in inland areas in the south.

In mountain areas the mean temperatures decrease with increase in altitude and the average decrease is about 2° C. for each 1,000 feet increase in altitude.

65. The mean height of the 0° C. isotherm is about 15,000 to 16,000 feet throughout the year in this area.

66. The table below gives the average daily maximum and minimum temperatures for each month for five places in the Republic.

Average Daily Maximum Temperature (°C.)

Station	Period yr.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year.
Berbera ..	30	29	29	30	32	36	42	42	41	39	33	31	29	34
Sheikh ..	22	21	23	26	27	28	29	28	28	29	26	23	21	26
Hargeisa ..	30	25	27	29	30	31	31	30	30	31	29	27	25	29
Bardera ..	10	38	39	40	38	37	36	33	34	35	35	36	36	36
Mogadiscio	13	30	30	31	32	32	29	28	28	29	31	30	30	30

Average Daily Minimum Temperature (° C.)

Station	Period yr.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Berbera ..	30	20	22	22	25	27	30	31	31	29	24	22	20	25
Sheikh ..	22	8	9	11	13	14	17	16	16	16	12	9	9	12
Hargeisa ..	30	11	12	14	16	17	18	17	17	17	13	12	11	15
Bardera ..	10	22	23	23	24	23	22	21	21	22	22	23	23	22
Mogadiscio	13	23	23	24	26	25	23	23	23	23	24	24	24	24

HUMIDITY

67. On the coast and near to large rivers, relative humidities in the south are high, averaging around 70 to 80 per cent. In the north, average relative humidities are high in winter but relatively low (some 40 to 50 per cent) in summer.

68. It is said that when wet bulb temperatures reach, or exceed, 26° C. heavy manual work, in still air conditions, should be be reduced to a minimum. Such wet bulb temperatures occur on many occasions from March to May and in November and December in the south and from April to October in the northern coastal area.

PRECIPITATION

69. Precipitation amounts are small, by United Kingdom standards, in most areas and very small in the northern coastal plain. In the hills, precipitation amounts are probably greater, but data are very sparse.

70. On the coast, average annual falls are greatest (about 20 inches a year) in the south and decrease northwards to become negligible in some localities on the Gulf of Aden coast. Generally speaking, the seasons of greatest precipitation amounts are the spring and Southwest Monsoon season, but on the Gulf of Aden coast most of the very scanty precipitation falls during the winter. In the south, average precipitation amounts are around 20 inches a year ; on the north coast they are some one to 4 inches a year.

71. Most of the precipitation falls as showers, which may be heavy and accompanied by thunder. Heavy falls of rain during 24 hours occur occasionally, e.g. a fall of over 6 inches in a day has been recorded at Mogadiscio and over 5 inches at Berbera.

72. The table below gives average monthly rainfall values at six places in the Republic.

Average Monthly Precipitation (*inches*)

Station	Period yr	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Berbera ..	30	0·3	0·1	0·2	0·5	0·3	*	*	0·1	*	0·1	0·2	0·2	2·0
Sheikh ..	23–24	0·2	0·5	1·3	3·1	3·0	1·5	1·3	2·1	2·9	2·8	1·0	0·6	20·3
Hargeisa ..	30	0·1	0·3	1·0	2·4	2·4	2·3	1·7	3·2	2·3	0·4	0·3	*	16·4
Bardera ..	11	0·4	0·2	0·9	2·8	2·1	0·2	0·4	0·3	0·3	2·2	1·9	1·4	13·1
Mogadiscio	21	*	*	*	2·3	2·3	3·8	2·5	1·9	1·0	0·9	1·6	0·5	16·8
Brava ..	—	0	0	0·1	3·0	4·6	3·9	3·8	1·1	1·1	0·4	1·7	0·5	20·2

* Less than 0·1.

WIND

73. Generally, surface winds over the area are monsoonal in character. The Northeast and Southwest Monsoons prevail during the winter and summer periods, respectively. The prevailing winds are much modified by topographical effects, and, along the coasts, by the land and sea breeze effects.

74. The Northeast Monsoon predominates from December to March and the Southwest Monsoon from June to September. April-May and October-November are short transition periods of variable winds. Broadly, the Southwest Monsoon moves northward during April and May, becoming established over the whole area by June and then retreats southward again during October and November, but there are considerable variations with locality and from year to year.

75. Winds are generally light in most coastal areas, but strong to gale force winds are frequent along the Gulf of Aden coast during the Southwest Monsoon period. Gales are not frequent, except near to Berbera.

Strong winds (24 *kt or more*) *and Gales* (34 *kt or more*)

76. Strong winds or gales occur at times and are frequent in some areas along the north coast. At Berbera, gales are reported on an average of 53 days a year, mainly during the months June to August, but elsewhere they are infrequent. Strong winds occur quite often during the summer at Hargeisa, Berbera and Bender Cassim, but they are infrequent elsewhere.

Local winds

77. *Land and sea breezes* occur throughout the year. The sea breeze, which is usually most marked when the monsoon is weak, occurs by day and, when it reinforces the prevailing wind, may give rise to a fresh or strong wind. The land breeze normally blows at night and in the early morning and is usually less well marked than the sea breeze.

78. *The "Kharif"* is a strong southwesterly wind which blows along the African coast of the Gulf of Aden during the Southwest Monsoon period of June to September. It is a hot, dry, off-shore wind which blows mainly at night and usually attains its maximum speed about dawn. It is often strong and may reach gale force, especially in the area around Berbera, and usually raises extensive dust or sand haze.

79. *Tropical cyclones* affect the Gulf of Aden area *very* infrequently. They may occur in May and June or in October and November.

Upper winds

80. The table below gives the estimated mean *vector* winds and standard *vector* deviations (S.V.D.) for various pressure levels over two places.

Pressure level mb	Average height ICAN ft.	January			April			July			October		
		Dir. Deg.	Speed kt	SVD kt	Dir. Deg.	Speed kt	SVD kt	Dir. Deg.	Speed kt	SDV kt	Dir. Deg.	Speed kt	SVD kt
						Berbera 10° 26′ *N.*, 45° 01′ *E.*							
700	9,900	090	10	10	040	08	11	Var	05	14	030	10	11
500	18,300	Var	05	14	060	08	15	020	10	16	090	10	15
300	30,100	250	10	20	270	10	18	110	20	10	090	06	17
200	38,600	270	12	27	290	15	24	080	40	15	150	10	25
150	44,600	270	10	24	290	10	19	100	60	21	150	10	19
100	53,100	300	08	20	Var	05	20	100	60	22	110	12	20
						Mogadiscio 02° 02′ *N.*, 45° 21′ *E.*							
700	9,900	040	10	10	070	10	13	Var	05	18	070	05	13
500	18,300	060	12	12	080	10	13	Var	05	18	080	10	13
300	30,100	100	10	18	090	10	15	080	10	15	100	10	15
200	38,600	100	18	22	250	05	20	080	20	17	220	10	20
150	44,600	090	10	25	090	08	17	100	28	22	220	08	17
100	53,100	080	10	18	Var	05	18	080	30	22	120	20	18

Jet streams

81. In July, a belt of strong easterly winds develops over Southern Arabia at heights of 35,000 feet, or above. The main axis of this jet stream usually lies in latitude 15° N., but the northern part of the Republic is affected at times. This jet blows approximately due east and, during July, mean speeds over the northern-most area reach 60 knots, while maximum speeds occasionally exceed 100 knots. These easterly winds usually attain their greatest speeds between 45,000 and 50,000 feet.

Sea and Swell

82. Off the east coast high waves occur most often during the Southwest Monsoon. Between May and September waves are over 5 feet on 58 per cent and over 12 feet on 11 per cent of recorded occasions. During the Northeast Monsoon, in the period December to February, the corresponding figures are 24 per cent. and 0·5 per cent.

83. No direct information is available of sea conditions close to the north coast of the Republic, but with on-shore winds the waves of the open sea can be expected right up to the shore ; they may even be increased in the afternoons by the sea breeze which is prominent on this coast in all months except July and August. During the Southwest Monsoon waves over the open sea exceed 5 feet on 16 per cent of occasions and 12 feet on 1 per cent of occasions. During the Northeast Monsoon waves exceed 5 feet on only 4 per cent of occasions and seldom exceed 12 feet. In this season the roughest seas are found mainly in the Western Gulf of Aden and in the Straits of Bab-el-Mandeb.

Cloud

Cloud amount

84. Average cloud amounts over the area as a whole are less than those over the United Kingdom and, in fact, on the coast in the north they are very much less. In southern areas, cloud amounts average about 4 to 5 eighths over the year as a whole. In the north they average about 2 to 3 eighths along the coast and 3 to 4 eighths over the mountains, so far as available records show. Cloudless skies occur quite often in the north, especially in the morning and evening ; they are *least* frequent on the coast in winter. In the south, cloudless skies are infrequent except, inland, from December to March.

Cloud Type

85. Cloud type is mainly cumuliform, but stratiform clouds occur quite frequently in the Southwest Monsoon season, especially over the mountains and in the south of the area.

Cloud height

86. Cloud bases, in this region, are most frequently between about 2,000 and 4,000 feet, but in northern coastal areas there are many occasions when there is no cloud below 8,000 feet during the period May to September, especially in the morning and evening.

87. Very low cloud (base below 1,000 feet) occurs at times, usually as early morning stratus or in conjunction with heavy rain. In most areas it averages less than 1 per cent of the occasions over the year as a whole, but may occur on 5 or 10 per cent of occasions in some localities in the worst months. In general, it is most frequent from December to March in the hilly districts of the north and from May to July on the Indian Ocean coast.

VISIBILITY

88. Visibility is, on the whole, in excess of $6\frac{1}{4}$ miles, or even $12\frac{1}{2}$ miles, for much of the time. In some areas, however, especially in the north, haze is fairly frequent from June to August, and fog (with visibilities less than 1,100 yds.) occurs quite often at some high level stations from November to March.

89. At Berbera and Bender Cassim fog occurs on 1 per cent, or less, of occasions, at 0500, 0900, 1430 or 2030 local time, in any month. At Hargeisa, fog averages some 3 to 8 per cent of occasions, at 0600 local time from November to March, but 1 per cent, or even less, in any month at any of the regular hours of observation. In the south, available records show 1 per cent, or less, of occasions of fog, at either 0830 or 1430 local time, in most months.

Sandstorms or Duststorms

90. Duststorms or sandstorms are experienced occasionally, but records are very sparse. They are most frequent in the northern coastal area, where they occur mainly between June and August.

PROPAGATION OF RADAR OVER SEA AND COASTAL AREAS

91. Over the Gulf of Aden increased radar detection ranges may occur between March and July. Normal conditions prevail in other months in this area, and throughout the year over the Indian Ocean to the east of the Somali Republic.

92. Over land normal propagation is likely throughout the year, but conditions may occasionally be suitable for the development of super-refraction during the dry season, mainly at night or in the early morning.

SUMMARY OF THE MAIN FEATURES OF THE CLIMATE

93. (*a*) The climate is hot, or very hot, throughout the year. In most inland areas it is humid in summer and fairly dry in winter ; on the north coast it is relatively dry in summer. Mean *monthly* maximum temperatures vary from 30 to 45° C., and mean *monthly* minimum temperatures from 17 to 29° C., according to location and month.

(*b*) Rainfall amounts average around 20 inches a year in the south, decreasing northwards to approximately 2 inches on the north coast.

(*c*) Winds are monsoonal ; southwesterly from about June to September and northeasterly from about December to March. In the Berbera area the southwesterly wind reaches gale force quite often, during the early morning, between June and August.

(*d*) Visibility is usually good or very good, but haze is quite frequent in arid areas, particularly along the north coast in summer.

(*e*) Tropical cyclones very infrequently affect the Gulf of Aden. The most likely seasons for their occurrence in the area are May and June or October and November.

CHAPTER V

MAP COVERAGE : NORTHERN REGION

GENERAL

94. Despite the production of useful new mapping since 1956, the situation in this part of the Somali Republic is not yet entirely satisfactory. A fairly good basic series at a scale of 1 : 100,000 is now available as Y623, although it is uncontoured, relying on hachures for the portrayal of relief, and its portrayal of many remote areas is relatively inadequate.

95. At 1 : 250,000, there is no operationally reliable map, although at 1 : 500,000 complete cover has been produced in Series 1404 (World). It is based chiefly on Series Y623 and suffers from the same inadequacies, but it has approximate form lines which give a general idea of the relief and it is a considerable improvement on previous small-scale mapping. A new Topographic Navigation Chart at a scale of 1 : 1,000,000 has been published recently by D. Survey. This is a reproduction with minor revision of the American Operational Navigation Chart and will eventually replace the existing G.S.G.S. 4695 Aeronautical Charts.

96. Two small areas are covered by reliably contoured mapping at a scale of 1 : 25,000 in Series Y823, and a small area in the north is covered by uncontoured 1 : 50,000 scale mapping in Series Y721.

97. Town plans of Berbera, Burao and Hargeisa are available in Series Y921 at a scale of 1 : 5,000. For further information see B.I.S. Part VIIIB—Towns.

Grids

98. The current grid in this area is the East Africa Grid. The D.O.S. mapping in Series Y625, Y721 and Y823, however, shows grid ticks for U.T.M. grid, which is not yet operational in this area.

Place Names

99. The chief authorities for place names are the 1 : 100,000 series Y623 and the 1 : 500,000 series 1404.

Gazetteers

100. There are two available gazetteers. One is based on Series 2201 (Africa 1 : 2,000,000, published in 1947, and the other on Y401 (East Africa 1 : 500,000).

Available Mapping

101. The following table gives a selective list of available mapping.

Selected Available Mapping—Somali Republic (Northern Region)

Scale	Series No.	Title	Coverage	Date	Availability	Remarks
1 : 5,000,000	1106	World—N.E. Africa	Total (sht. 3)	1961	Bulk stocks	
1 : 2,000,000	2201	Africa	Total—1 sht.	1943	,,	Out of date.
1 : 1,000,000	T.N.C.	R.A.F. Topographic Navigation Chart.	Almost total on sheet T.N.C. K-6.	1964	,,	Based on U.S.A.F. O.N.C. sheet K6, Base 100, with minor revision by S.P.C., R.E.
1 : 500,000	1404	World	Total	1959	,,	Based on the 1 : 100,000 series, Y623. Heights not always reliable, but otherise fairly accurate.
1 : 125,000	Y625 (D.O.S. 539)	Somaliland Protectorate	Total	1952	,,	Compiled mainly from 1950-1952 air photography. Monochrome. Relief shown only by hachures. U.T.M. grid ticks.
1 : 100,000	Y623	British Somaliland	Total	1956-58	,,	Photographically enlarged from the above. Gridded (E. Africa grid).
1 : 50,000	Y721 (D.O.S. 27)	Somaliland Protectorate	4 sheets near coast at 46° E.	1952	,,	Monochrome, preliminary plots, with some relief shown by hachures. Compiled from air photography flown 1946-47. U.T.M. grid ticks.
1 : 25,000	Y823 (D.O.S. 339)	Somaliland Protectorate	9 sheets—5 near Hargeisa and 4 approx. 40 mls. S. of Berbera.	1959-60	,,	Compiled from 1951-52 and 1958 air photography, field checked 1958. Contoured. U.T.M. grid ticks.
*Town Plans**						
1 : 5,000	Y921	Berbera Burao Hargeisa		1962-63		First compiled from information dated 1959, and revised in 1962 from material dated 1960. Gridded.

* See also B.I.S. Part VIII B—Towns.

CHAPTER VI

MAP COVERAGE : SOUTHERN REGION

General

102. Mapping for this part of the Somali Republic is unsatisfactory from almost all aspects. At the end of W. War II all available material was compiled by E.A. Forces into a 1 : 500,000 scale series of East Africa and published by the War Office as Series Y401 (G.S.G.S. 4355). This, however, is a poor quality series now out of date and the small scale series compiled from it are also unreliable. The situation regarding new medium scale mapping has improved by the use of recent air photography in new compilations, but there are no new large scale maps and 1 : 500,000 is still the largest scale at which total cover is available.

103. Two large scale series at 1 : 25,000 and 1 : 50,000 were produced by E.A.F. in 1941, both covering the Juba River. The value of these is doubtful, but stock is being retained until better large scale maps are produced. At the same time E.A.F. produced strip maps at various scales covering the main routes, copies of which are available for library reference.

104. In the medium scale range three series published by the Ministry of Defence, Army Department, are available : Series 1404 and Y401 at 1 : 500,000 and Series Y503 at 1 : 250,000. Coverage by Series 1404 and Y503 so far is limited, but where sheets have been published they are preferred to the older Series Y401. Series Y503 is compiled partly from air photography dated 1959-60 and is planimetrically good, although portrayal of relief is considered unreliable. The 1404 sheets are new compilations, but again relief information (form lines and altitude tints) should be used with caution.

105. Series 2201, 1 : 2,000,000 and Series 1301, 1 : 1,000,000 are similar in presentation, each series compiled directly or indirectly from the East Africa 1 : 500,000 sheets. Series 1301 gives very little additional information to the 1 : 2,000,000 sheets and the relevant sheets of both series, dated 1943-1945, are now in need of revision. The R.A.F. Aeronautical Charts at a scale of 1 : 1,000,000, G.S.G.S. 4695, corrected in 1950, show far less detail than the land maps, but give several different road alignments which may be more reliable. Series 1404 at 1 : 500,000 is planimetrically considerably more detailed than all the above series.

106. The latest developments in small scale mapping are the plans for producing new Topographical Navigation Charts (T.N.C's, scale 1 : 1,000,000). These will eventually replace G.S.G.S. 4695. The one sheet published so far by A.C.I.C. and reproduced by Ministry of Defence, Army Department, although only form-lined, shows relief in far greater detail than any existing land maps, with hill shading, wadis, sand areas, and lakes. Several serious height discrepancies of up to 2000′ between this sheet and the Series 1404 sheet, though, cast some doubt on the degree of accuracy of both series.

107. The only town plan available is the plan of Mogadiscio at 1 : 12,500 in Series Y921 published by the U.S. Army Map Service in 1961 ; the map is not field checked however and must not be considered reliable. For further information see B.I.S. Part VIIIB—Towns.

Grids

108. The current British military operational grids are the East Africa belt grids north of 0° and U.T.M. grid south of the Equator. The A.M.S. town plan of Mogadiscio, however, is U.T.M.-gridded.

Place Nanes

109. The authoritative sources for place names are Series 1404, Y503 and the Italian 1 : 400,000 scale series " Carta della Somalia ", but Series Y401 is an acceptable source.

Gazetteers

110. Two gazetteers are available : an Index Gazetteer showing place names on the 1 : 2M map series, published by M.E.L.F. in 1947 and an Index Gazetteer showing place names on the 1 : 500,000 series, published by M.E.L.F. in 1946.

Available Mapping

111. The following table gives a selection of available mapping.

Selected Available Mapping—Somali Republic (Southern Region)

Scale	Series No.	Title	Coverage	Date	Availability	Remarks
1 : 5,000,000	1106	World. Sht. 3—North-eastern Africa.	Almost total	1960	Bulk stocks	Ungridded. Altitude tints. A convenient small scale map in one sheet.
1 : 2,000,000	2201	World	Total (3 shts.)	1943	,,	Published by War Office.
1 : 1,000,000	1301	World	Total	1945-46	,,	,, ,, ,,
1 : 1,000,000	T.N.C.	Topographical Navigation Chart	N. of 8° N. sht. T.N.C.-K-6	1964	,,	Based on U.S.A.F. O.N.C. with minor revision by S.P.C.
1 : 1,000,000	G.S.G.S. 4695	R.A.F. Aeronautical Chart	Total	1950	,,	Based on U.S.A.F. W.A.Cs, corrected in 1950.
1 : 1,000,000	U.S.A.F. W.A.C.	World Aeronautical Chart	Total	1962	Lib. ref.	Revised edns. dated 1962. Same basic topographic information as G.S.G.S. 4695.
1 : 500,000	1404	World	N. of 8° (3 shts.)	1960-62	Bulk stocks	Gridded. Compiled by Ministry of Defence Army Dept. from Series Y401 ; Italian 1 : 400,000 series ; G.S.G.S. 4695 and other sources.
1 : 500,000	Y 401	East Africa	Total (20 shts.)	1940	,,	War Office reprints of E.A.F. editions. Compiled from Italian " Carta della Somalia " 1 : 400,000 1930-1939 and other sources.
1 : 500,000		Carta geologica	Partial	1957-59	Lib. ref.	
1 : 250,000	Y503	East Africa	W. of 42° E. (6 shts.)	1963-64	Bulk stocks	Compiled by Min. of Def. Army Dept. from air, photographs and Italian 1 : 400,000 series. Gridded.
1 : 50,000	E.A.F.	River Giuba	14 shts.	1941	Limited stocks.	From various sources. Monochrome, partly contoured. Gridded.
1 : 25,000	E.A.F.	Lower Giuba (Juba)	19 shts.	1941	,,	From air photographs dated 1941. Monochrome. Uncontoured. Gridded.
*Town Plans**						
1 : 12,500	Y921	Mogadiscio		1961		Published by A.M.S. Not field checked and not to be considered reliable. Contoured. U.T.M. Grid.

* See also B.I.S. Part VIII (B)—Towns.

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BRITISH INTELLIGENCE SURVEY

SOMALI REPUBLIC—PART VIII (A)

TERRAIN, CLIMATE AND MAP COVERAGE

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SOMALI REPUBLIC — RELIEF

MAP I

42° 44° 46° East of Greenwich 48° 50° 52° 54°

12° 10° 8° 6° 4° 2° N. 0°

YEMEN
PROTECTORATE OF SOUTH ARABIA
Aden
GULF OF ADEN
SOCOTRA
FRENCH SOMALILAND
Djibouti
Loyada
Zeila
Alula
Bereda
Olloch
Tohen
Cape Guardafui
4593
Candala
Durdureh
Gaan
Elayu
Bender Cassim
7218
Las Khoreh
Mait
5617
Ras Khansira
Ras Sudda
Raguda
7898
Erigavo
Hordio
Dante
Saba Wanak
Berbera
Bulhar
Hagal
Las Dureh
El Dur Elan
6556
Sheikh
6014
Borama
Hargeisa
Burao
Odweina
Tug Dot
Buran
Daror Valley
Scusciuban
CARCAR HILLS
Gardo
Bender Beila
SHOL PLATEAU
Ainabo
Nogal Valley
Las Anod
Garoe
Bohotleh
Gori Rit
Eil
ETHIOPIA
El Hamurre
Rocca Littorio
MUDUGH
Ghelinsor
INDIAN OCEAN
Sinadogo
Obbia
Ferfer
Belet Uen
Iet
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Harardera
Dirri
Dolo
Oddur
Mandera
Lugh Ferrandi
Bulo Burti
Meregh
Iscia Baidoa
Mahaddei Uen
Bur Acaba
El Wak
Gobaad
Bardera
Dinsor
Balad
Afgoi
Mogadiscio
KENYA
Dif
Brava
Liboi
Afmadu
Gelib
Chisimaio
Bajun Islands
Kolbio

Approximate Scale

Miles 50 0 50 100 150 Miles

Kilometres 50 0 50 100 150 200 250 Kilometres

REFERENCE

- International Boundaries
- ,, ,, (Undemarcated)
- Land below sea level
- Land below 656 ft (200 metres)
- Land over 656 ft (200 metres)
- ,, ,, 1640 ft (500 ,,)
- ,, ,, 3281 ft (1000 ,,)
- ,, ,, 4921 ft (1500 ,,)
- Spot heights in feet · 7898
- Drainage: perennial, intermittent
- Marsh

Compiled and drawn by D.I.S. Jan. 1965

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SOMALI REPUBLIC — VEGETATION

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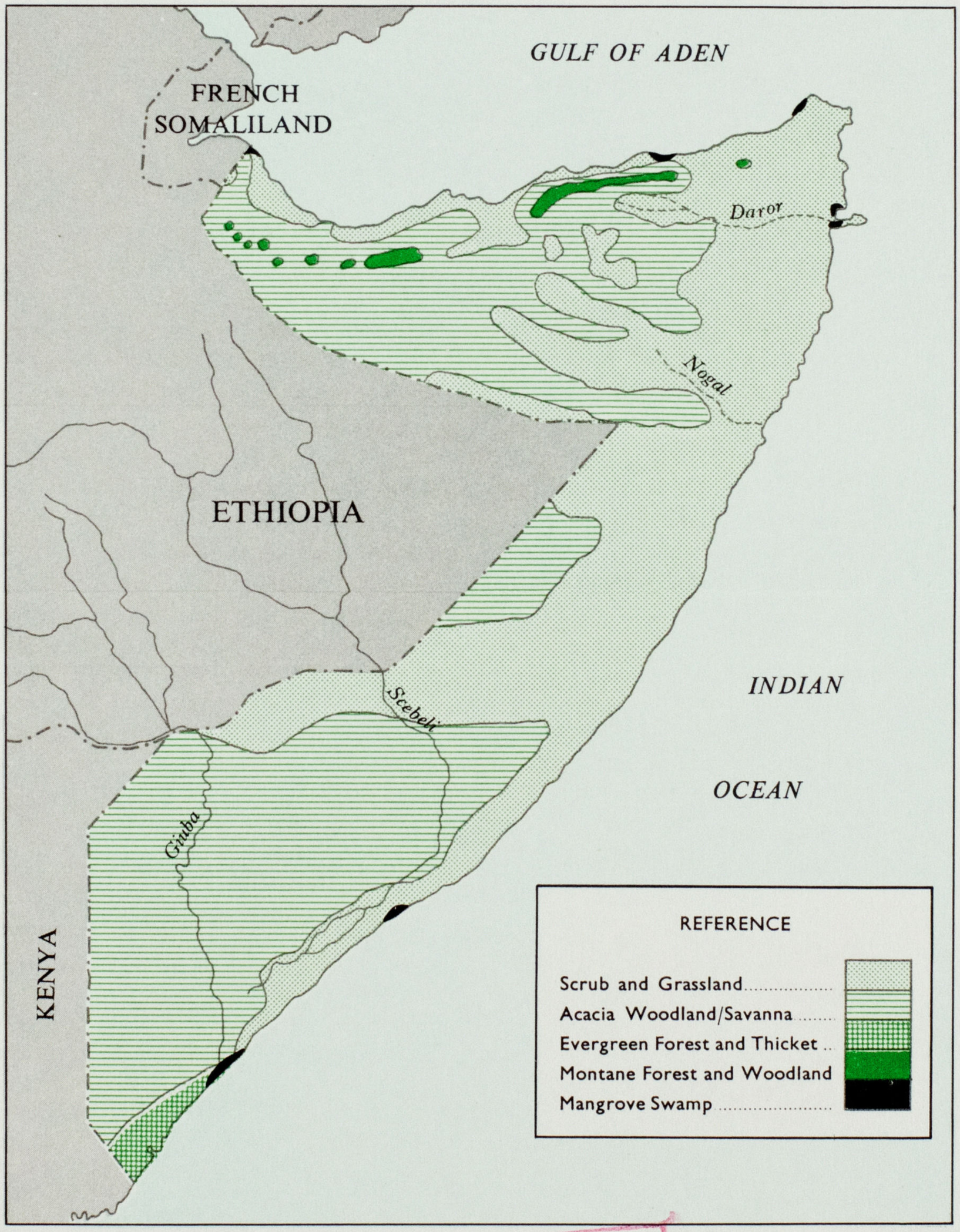
MAP 2



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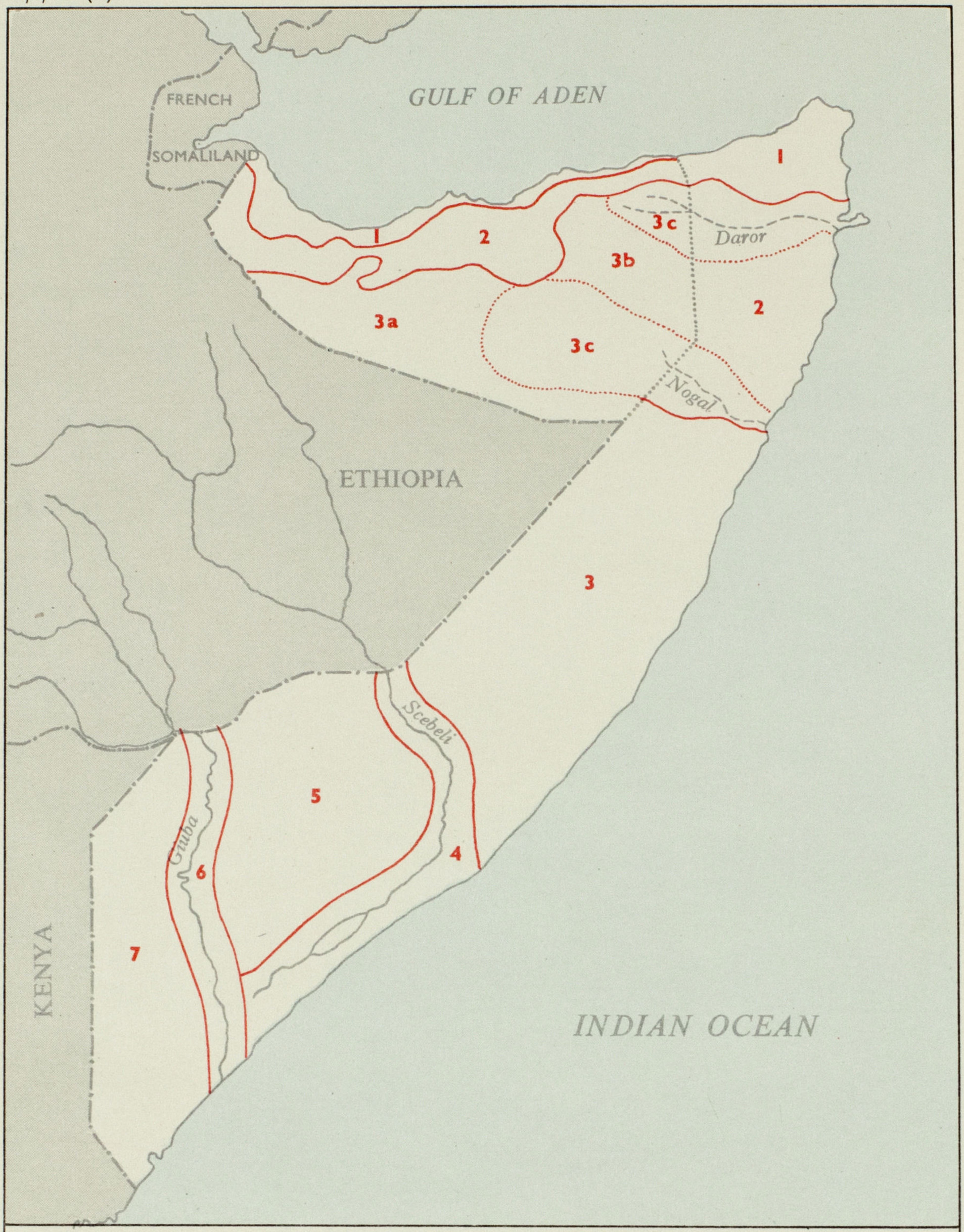

SOMALI REPUBLIC—TERRAIN REGIONS

Northern Region

1. Coastal Lowlands
2. Escarpment Zone
3. Interior Plateau
   - (a) Haud
   - (b) Sol Haud
   - (c) Nogal and Daror Valleys

Southern Region

1. Northern Mountains and Coastal Lowlands
2. Shol Plateau, Daror and Nogal Valleys
3. Mudugh Plateau and Coastal Lowlands
4. Scebeli Valley
5. Scebeli-Giuba Plateau
6. Giuba Valley
7. Trans-Giuba Plateau and Coastal Lowlands

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